Pests

Ants

Actual size:
1/16" – 1"

There are many species of ants found in homes and gardens in the Northwest. Ants do not directly harm plants, but if they are a nuisance, have your particular type identified by someone at a nursery or WSU Cooperative Extension office. Also see the "Carpenter ants" listing.

Prevention

Store food in tightly sealed containers. Keep all kitchen surfaces clean and free of food scraps and standing water.

Physical control

If a line of ants is marching across the kitchen, find the point of entry and seal it. Use a silicone seal. Use petroleum jelly for a short-term fix until you have time to do a better job. Remove what the ants are eating and mop them up with soapy water. Some have found that sprinkling red chili pepper at the entry point helps discourage ants. Wrap a band of tape, paper or cotton coated with a sticky substance such as Tanglefoot around the main stem of outdoor plants to trap ants.

Biological control

Birds, bee flies, humpback flies and thick-headed flies are natural predators outdoors.

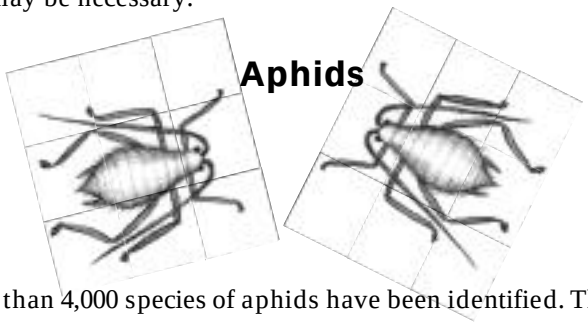
Least-toxic chemical control

Diatomaceous earth, silica gel, boric acid and pyrethrum can be effective. Diatomaceous earth and silica gel are dusts that kill insects by drying them out. They are dangerous to breathe, so if they must be blown

into wall spaces, a professional should do the job. Pyrethrum can be combined with silica gel to give a faster effect; one form comes in a non-aerosol squeeze dispenser that allows for application in cracks and crevices to minimize human and pet contact. Boric acid can be used in cracks, but only in areas not accessible to crawling children or pets. Prepare 1 percent boric acid solution by mixing one teaspoon boric acid, six tablespoons granulated sugar and two cups warm water. Store in a clear container. Use on cotton balls placed in the bottom of a plastic cup or tub with holes cut for ants to enter. Recharge each week. After three to four weeks, use 1/2 percent solution for continuous control. You can also use insecticidal soap to drench an ant colony outdoors or in a crawl space. More than one treatment may be necessary.

Aphids

Actual size: 1/8”



More than 4,000 species of aphids have been identified. There are black, brown, red, purple, pink, green and yellow aphids. Some have wings and others do not. They all have a soft body about 1/8” long and a soda-straw mouth part adapted for extracting plant juices. Because aphids bear live young, their populations grow rapidly. Late in the fall, males are born to fertilize overwintering eggs. These eggs, deposited in plant crevices and garden debris, withstand inclement weather to hatch in the spring. Most aphids excrete a sweet, sticky substance called honeydew as they feed. It serves as food for ants, bees and flies and as a growing medium for sooty mold.

Prevention

Avoid planting species that attract aphids. These include birch trees, roses and certain vegetable varieties such as brussels sprouts. Consult your local county extension office or nursery for help choosing aphid-resistant plants. Also be sure that plants are healthy and have proper growing conditions. Weak or stressed plants are more susceptible to attack.

In the fall, get rid of all garden debris where aphid eggs can overwinter, and cultivate the garden soil 6” to 8 ” deep where possible.

Physical control

For small infestations, hand pick and destroy the aphids. On sturdy plants, use a strong spray of water to wash them off. If ants are also present, follow the steps outlined in the "Ants" section.

Biological control

Aphid predators include syrphid flies, green lacewing larvae and ladybugs (also called ladybird beetles). Chalcid and braconid wasps are aphid parasites. Parasite and predator populations often lag behind aphid populations, so there may be periods in the year, particularly in the spring, when the aphids appear to be out of control. Often the predators can catch up and restore control, but be patient. Remember to provide the basics: water, shelter and food. Plants may develop some damage but should outgrow it. If pesticides are applied when predator populations are present, they may be harmed and prevented from keeping aphids in check.

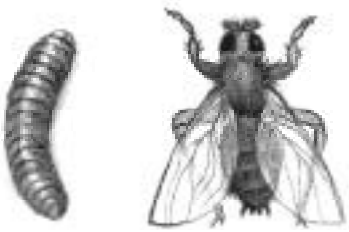
Ladybugs and lacewings can be effective in controlling aphids. They are available from many nurseries. Before introducing any predators, reduce aphid numbers by pinching off severely affected plant parts or hosing off most of the aphids. For best results with ladybugs, choose the right time of year and time of day to release them. Ladybugs are most active when the weather is warm, from April through September. Dusk is the best time of day to release them. Water the foliage where the aphids are feeding. The hungry and thirsty ladybugs will be attracted to the water-drenched foliage and find the aphids for food. They do have a tendency to disperse when released. Both the ladybug adult and larvae are predators. Green lacewing larvae are also effective predators of aphids and can be purchased and released.

Least-toxic chemical control

Insecticidal soap sprays are often very effective in controlling aphids, although you may need repeat applications. To make your own, mix one tablespoon castile or ivory soap in one gallon of water. Spray on infested plant parts. (This also works for mites.) It is important to use pure soap only. Detergent can burn plants. Use rotenone, sabadilla or pyrethrum only as a last resort for severe infestations. A dormant oil spray applied in the winter may smother overwintering aphid eggs, but you may want to wait to take action until the problem reappears.

Apple maggots

Actual size:
Adult 1/4"
Maggot 1/4"



This pest makes brown tunnels inside apples with external symptoms so slight they may go unnoticed. The adult apple maggot is a fly, similar to the common housefly. Flies lay their eggs in the apples, and the legless white maggots develop in the flesh of the fruit. The insect spends the winter in the soil in its pupal stage.

Physical control

Collect dropped apples to reduce the apple maggot population. If not too badly damaged, these apples can be made into cider.

Trap adult flies with a solution of one part blackstrap molasses or malt extract, nine parts water and enough yeast to create fermentation. Once the fermentation subsides, pour the liquid into wide-mouthed jars, coffee cans or milk cartons. Hang the containers in the trees as traps.

Another effective trap is a red plastic sphere, made sticky by applying a commercially available sticky compound such as Tanglefoot, hung in trees to trap the insects when they land. These traps are available at garden centers or can be made at home.

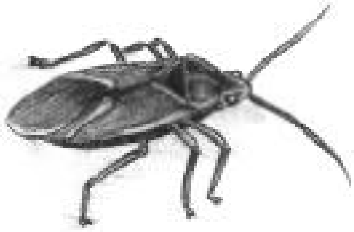
If apple maggots are a consistent problem, consider planting thicker-skinned later varieties such as Winesap and Jonathan.

Biological control

Yellow and red sticky boards, available at garden centers, attract apple maggot flies. The flies are drawn to the color and are caught on the trap's sticky surface.

Boxelder bugs

Actual size:
1/2”



These bugs feed on the seeds of box elder, maple and ash trees. Full-grown boxelder bugs are about 1/2” long with reddish brown or black bodies and red lines. The young are bright red. After feeding on plants in your yard during the summer, boxelder bugs may enter your house for a warm place to winter. However, they will not feed on anything and will not cause damage.

Physical control

For smaller infestations, try hand picking the bugs. Reduce their numbers by removing nearby unwanted female box elder trees (they produce the seeds). Inside, sweep them up and dispose of them. If you use a vacuum, dispose of the bag so bugs can’t crawl back out once the vacuum is stored away or place the bag in the freezer for a few days to kill the bugs. Also, seal cracks in exterior walls and around windows. Look for boxelder bugs in warm, sunny places in spring, such as on the south side of a house. They tend to congregate under such conditions and can be vacuumed up with little effort.

Least-toxic chemical control

Spray trees with insecticidal soap or summer oil when pests appear. However, don’t use this approach on Japanese maples as it may damage foliage.

Carpenter ants

Actual size:
1/4" – 1"

Unlike termites, carpenter ants don't actually eat wood. They nest in it. If you find them in your house, look for a good professional who understands your concerns about toxic chemicals and will work with you to select a least-toxic control program. While they can cause serious damage to houses, these ants are actually beneficial insects in the forest, where their excavations help speed the decomposition of dead trees. In fact, they prefer to build their nests in decayed or rotted wood, but will eventually extend their tunneling into sound wood if they can't find decayed wood.

Positive identification requires collecting a few of the largest ants and inspecting them under a magnifying glass. Carpenter ants have a smooth upper back, while most other ants have a dip in this area. Suspicious signs include sawdust and debris, rustling sounds in the walls and trails of ants between the foundation and wood outside the home.

Carpenter ants eat dead insects, honeydew exuded from aphids, plant juices and sweet or fatty foods in the home. To assess the extent of the problem, locate the main colony. Seventy-five percent of all main nests are located outside the house where there is abundant moisture, such as in an old tree or tree stump above or below the soil surface. Satellite nests may be found inside your house, in walls and ceilings, under outdoor siding, near downspouts or roof gutters, in floors – particularly bathrooms – or in insulation. Begin with the basement and work up to the attic, looking for the ants and sawdust-like wood shavings.

Prevention

Remedy whatever attracts them to your house in the first place. Repair any rotten or weather-damaged wood and make sure that attic and crawl space ventilation is adequate. Inspect gutters and downspouts to be sure they do not leak and that water is being diverted away from the house. Clean out the gutters. Remove any wood in contact with soil at any part of the house, porch, deck, etc. Firewood should not be piled against the side

of the house. It should be elevated off the ground and kept away from the house. Trees and shrubs should be pruned back so that they do not touch the house or garage, including roofs. Stumps should be completely removed. Even decorative bark may harbor carpenter ants and provide nesting sites.

Physical control

Locate and remove all nests, capture stray ants, caulk access points and replace all damaged wood. This sounds like a tall order, but if the infestation is accessible and has not spread too far, you can be successful.

Least-toxic chemical control

Use desiccating dusts, such as diatomaceous earth or silica aerogel. Boric acid is a powder that can be blown into wall voids. Pyrethrum is also effective.

Carpet beetles

Actual size:
1/4" – 3/8"

This small beetle eats articles made of natural fibers, like wool sweaters and cotton or linen apparel. They leave an unmistakable calling card: their shed skins in the bottom of drawers and holes in articles stored there.

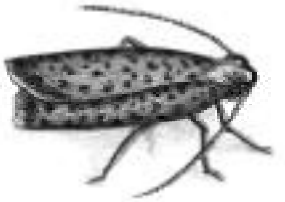
Prevention

The most effective control measure is to prevent infestations of carpet beetles. The best way to do this is to store items in a clean condition; beetle larvae are attracted to soiled areas, especially food stains. Store infrequently used items (that are clean) in well-sealed plastic bags or containers. Sachets made from rosemary, mint, thyme and cloves help repel these pests. Check cut flowers for adult carpet beetles before you bring them into the house.

Least-toxic chemical control

If you discover beetles inside the house, apply boric acid to the areas in which you find them.

Clothing moths



Actual size:
Wingspan 3/8" – 1 3/8"

These moths are very small, no longer than 1/2". They like to settle in dark places such as stored clothing or under furniture slipcovers, where they leave their eggs. The eggs hatch into larvae, which feed on anything containing wool, fur or feathers. They will also eat other fabrics if dirty and blended with wool. They are primarily attracted to dirt, lint, salt, stains, moisture and dead insects.

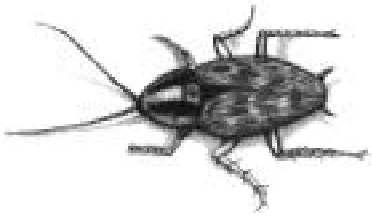
Prevention

Clean any used clothing or furniture you purchase before bringing them inside. Keep stored clothes and furniture clean and dry. Minimize humidity with good ventilation and control moisture sources.

Physical controls

Vacuum rugs, furniture and closets frequently. Clean out drawers used to store clothing. Store clothes in airtight containers or bags sealed with tape. While cedar and natural sachets smell wonderful, they are not effective at repelling moths. Shake out or brush clothing you wear infrequently to destroy any larvae present. Expose to air and sunlight. Placing clothing items in the freezer for several days will kill clothing moth adults and larvae.

Cockroaches



Actual size:
1/2" – 5/8"

These six-legged, hard-bodied insects can carry disease, contaminate food and induce allergies. They hide in cracks and crevices during the day

and feed at night on water and food crumbs, even wallpaper paste or envelope glue. They prefer warm, moist areas such as kitchens, bathrooms and around washing machines and hot water heaters.

Prevention

Cleanliness is crucial. Properly store and dispose of all kitchen wastes. Keep the kitchen clean and free of food scraps. Wash dishes immediately after eating. Keep areas where grease accumulates clean. Wash pastry cloths. Do not leave pet food or water bowls out at night. Enclose food in sealed containers. Fix dripping faucets and other leaks and make sure your dish rack drains properly. Damp, dirty mops can also attract roaches. Sweep frequently.

Physical control

If you find a cockroach nest, wash and vacuum the area if it is accessible. Plug cracks around baseboards, cupboards, pipes, sinks and water heaters with latex or silicone caulk. Move debris, firewood and garbage away from the house.

Least-toxic chemical control

Use boric acid, but keep it away from areas children or pets may explore. It is particularly useful under the stove and refrigerator or in cracks that cannot easily be plugged. Use roach traps that contain boric acid to monitor the effectiveness of your prevention and control measures.

Codling moths

Actual size:
Moth wingspan 3/4"
Larva 1"

Codling moths emerge in the spring and lay eggs that hatch into larvae that pupate during late summer and fall. Codling moth larvae are a unique white color tinged pink with a brown head. They tunnel directly to the core of fruit, usually apples or pears.

Physical control

Wrap bands of burlap or corrugated cardboard around tree trunks just after bloom, before caterpillars begin to move down the tree (late spring) and maintain them through fall. This draws larvae looking for a place to pupate. Use several thicknesses and wire or tie them on. The corrugated cardboard ridges should be 3/16" wide and face toward the tree with the ridges running vertically. Remove the bands once a week in warm weather (every two weeks in cooler weather) and kill the larvae. Continue until you have harvested all the fruit. Even in the best situations, banding will control only a small percentage of codling moths because many pupate elsewhere in the tree or drop to the ground, bypassing the trunk.

Scrape away loose bark and destroy overwintering cocoons before warm spring weather.

Biological control

Garden centers carry pheromone traps that attract the male moths and kill them. Trichogramma wasps and braconid wasp larvae are natural parasites of moths. These wasps are available through various mail-order companies. You can attract parasitic insects by growing sweet alyssum or daisies nearby to provide a good nectar source.

Bt (Bacillus thuringiensis) has been used with some success to help control codling moths. However, to be effective, applications must be frequent and carefully timed to reach the larvae just as they hatch.

Least-toxic chemical control

Horticultural oil spray or ryania, a botanical insecticide, may be applied as eggs are laid and before they hatch. Time these sprays to coincide with moth catches in pheromone traps.

Crane fly larvae (European)

Actual size:
Larvae 1" – 1 1/2"

European crane fly is a recent arrival in Washington and looks much like the variety commonly found here. Adult crane flies look like giant mosquitoes, and are sometimes called mosquito hawks or mosquito eaters. The common variety is harmless and usually found around marsh areas. Crane fly larvae or grubs are worm-like insects up to 1 1/2" long that live in the soil and destroy grass roots, crowns and shoots, leaving brown patches in the lawn.

Prevention

Crane flies are attracted to soggy areas of your lawn, so minimize watering and/or improve drainage.

Physical control

Begin monitoring for larvae in early spring. Shorten the grass in one-square-foot patches in several places around your yard. Pour warm water mixed with a little soap (not detergent) on the patch and count the grubs that emerge. If levels are above 25 grubs per square foot, treatment may be appropriate. Consult with the WSU Cooperative Extension service for treatment options. A warm, dry fall may reduce the number of larvae because of their sensitivity to dryness.

Research in Colorado has shown that aerator shoes that strap onto your feet can be used to control grubs. The long spikes on the bottom of the aerator shoes pierce the grubs as you walk over the infected sod. Also, thatching or aerating the lawn can reduce populations. Do these treatments on a cool, moist day when grubs are at the surface.

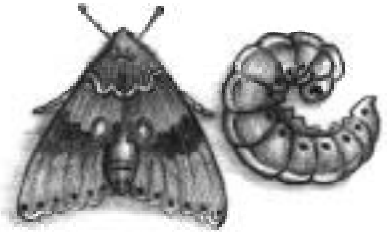
More than 100 species of birds are known to feed on crane fly larvae. Crane fly larvae are among starlings' favorite foods.

Biological control

Beneficial nematodes are effective when applied to the sod according to package directions. Use it once soil temperature rises above 55 degrees, usually in late spring, when the crane fly is in its larval stage.

Cutworms

Actual size:
Adult 1 1/2" wingspan
Caterpillar 1" – 2"



Cutworms are gray or brownish caterpillars that curl up when disturbed. They feed at night and hide in the soil during the day. Eggs are laid in the soil, and the larvae or pupae overwinter in the soil. A sure sign of cutworms is sliced-off stems of seedlings at soil level.

Physical control

Protect individual seedlings with a 3" tube made from stiff paper or plastic pressed 1" into the ground. Toilet paper tubes work well. Spread cornmeal or molasses near the base of each plant. Cornmeal wells up inside worms when they eat it, killing them. Molasses immobilizes them, but is effective only during dry weather.

Biological control

Beneficial nematodes or Bt (Bacillus thuringiensis) can be used. Follow package directions and apply under recommended conditions. Bt is most effective with younger, smaller cutworms.

Earwigs

Actual size:
3/8" – 5/8"

Earwigs are brown, beetle-like insects distinguished by a pair of long pincers at the tail end. Earwigs are scavengers of decaying matter and predators of insect eggs and larvae, slug eggs, snails and other slow-moving bugs. They are nocturnal feeders, spending the day under bark, stones and garden trash. They occasionally feed on foliage, flowers and other parts of many plants, including dahlias, zinnias, corn, hollyhock, lettuce, strawberries, celery, potatoes, seedling beans and beets. They usually come into the house only as transients and won't stay unless there is plant material for them to eat.

Physical control

Set sections of bamboo or damp rolled up newspapers horizontally through the garden or flower beds. Check the traps early each morning and dump the insects into a bucket of soapy water. Empty tuna cans containing 1/2" of vegetable oil also attract and drown earwigs.

Elm leaf beetles

Actual size:
1/4"

Elm leaf beetles are generally found on the big American, Siberian and Chinese elm trees and on zelkova, occasionally planted in place of elm. In spring, the adults lay eggs on the leaves. When the eggs hatch, the immature beetles eat all the fleshy parts of the leaf, leaving only the skeleton or veins. After a month or so, they are ready to pupate into the cocoon stage and descend to the base of the elm. They are about 1/4" long, and usually yellowish or golden in color with black markings.

Physical control

Because the pupae are visible on the ground around the tree, you can destroy them by simply smashing them. The elm leaf beetle can produce as many as three generations in the summer, which can seriously weaken the tree.

After feeding on plants in your yard during the summer, beetles try to enter your house during the fall for a warm place to winter. However, they do not feed on anything inside and will not damage your home. Sweep them up and dispose of them. If you use a vacuum, dispose of the bag so they cannot escape after the vacuum is stored away, or place the bag in the freezer for several days to kill the beetles.

Biological control

Check with your nursery for a specific variety of Bt (Bacillus thuringiensis var. san diego) that attacks beetle larvae. Tachinid flies and chalcid wasps are effective enemies of elm leaf beetles.

Least-toxic chemical control

Summer oil can control elm leaf beetle eggs and can be applied in the spring.

Fleas

Actual size:
Adult fleas – 1/16”

Fleas are a common pest west of the Cascades where winters are mild and homes are relatively damp. They inflict annoying bites, transmit tapeworms and can cause allergies in both animals and humans. Fleas are almost impossible to eradicate. You may kill most of the adults, but new eggs or larvae are waiting to carry on, and your pet will bring in more fleas from outside. Don’t dismay. You can keep the flea population low enough that it won’t be bothersome, and you can do it without using highly toxic products.

Decide at what level a flea problem becomes unacceptable to you. This may be one flea bite per week or finding two fleas each time you comb your pet. When fleas reach an unacceptable level, apply control measures starting with the physical ones. At any time, fleas may exist in all four life-cycle stages (egg, larva, pupa and adult) in your home. Follow these recommendations closely and use chemical controls only if necessary.

Physical control

Establish one regular sleeping area for your pet in a place you can clean easily and regularly. This is easier for dogs than for cats. With cats, you may have to place removable cloths in several places where they like to sleep. Any bedding materials and nearby rugs should be removed frequently and washed. Vacuum all areas to which your pets have access every week with a strong canister-type machine. Use a crevice tool and don't forget the upholstered furniture. During the "flea season" in the late summer and fall, you may need to vacuum more often – every third day or so. Dispose of the vacuum bag immediately so that the fleas cannot escape after the vacuum is stored away.

Severe flea outbreaks may require shampooing or steam cleaning rugs and upholstered furniture. Restrict your pets to certain rooms in the house. Do not allow them in bedrooms, hard-to-clean rooms such as basements and attics, or rooms belonging to family members particularly susceptible to flea bites. In severe cases, keep animals either outside or inside, but don't let them go back and forth. Small areas outside where your pet spends a lot of time (concrete areas, dog houses, garages or decks) can be kept relatively free of fleas by vacuuming. However, it is better to focus your efforts indoors, where you have more control.

To remove adult fleas from pets, comb them with a flea comb and bathe them. A flea comb has specially designed tines spaced to allow hair, but not fleas, to pass through. Several tine spacings are available. As you run the comb through your pet's fur, some fleas will jump away, but others will stay on the comb. Remove the fleas from the comb and drop them into a container of soapy water. When finished, flush them down the toilet. Count the fleas removed to estimate the flea population and monitor the need for other controls. Shampooing an animal knocks some fleas off and drowns others. Ordinary soap or shampoo work to a degree, but an insecticidal shampoo is more effective. Keep the soap away from the pet's eyes and stop using any product that produces skin irritation or allergies.

Least-toxic chemical control

Flea collars are not recommended because they contain very potent chemicals that may harm your pet. The safest chemical for killing fleas is an insecticidal soap. Separate soaps can be purchased for treating the pet and its surroundings. There are also insecticidal soap sprays available for inside/outside use to which a small amount of pyrethrum is added. Many other pyrethrum-based products are available. Cats are especially sensitive to pyrethrum, so if your cat does not tolerate it, try something else.

After soaps, the safest chemicals to kill adult fleas are the natural constituents of lemon peel oil, which are quite toxic to adult fleas and relatively safe to vertebrates. Use shampoos or area sprays that contain linalool. Do not substitute these products for a year-round program of non-chemical control.

Lufenuron (Program), also known as "flea birth control," is a once-a-month oral medication veterinarians can prescribe for pets. Fleas that feed on a dog or cat treated with the drug produce eggs that are unable to develop. When administered to all pets in a household, the treatment can be effective in reducing indoor flea populations. Because it does not kill adult fleas or prevent new fleas from being introduced from outside, it should be used in combination with other controls. Tests performed on dogs and cats taking lufenuron for two consecutive summers revealed no obvious side effects. However, because long-term toxicity studies have not yet been published, possible cumulative effects on pets are unknown.

Imidaclopril (Advantage) and fipronil (Frontline) are liquid formulations that are applied externally in one spot on the animal's back and kill adult fleas. They are effective for one month. They work by spreading over the body through skin oils, and kill fleas within 24 hours.

Methoprene, an insect growth regulator, mimics natural insect hormones and prevents immature fleas from becoming adults. It is quite specific to the target insect and is fairly safe to mammals. However, it does not kill adult fleas or eggs, so it must be used in combination with other controls. It is more effective when flea populations are just beginning to build, but you may not know that the problem is going to be serious enough to need chemical treatment. Methoprene is available in aerosol foggers and a concentrate. Foggers are not recommended because they do not concentrate the application in the areas where adults and larvae hide (carpets, bedding, etc.) and often contain other toxic ingredients. Spray the concentrate as directed.

Boric acid can be applied on inside carpets and diatomaceous earth can be spread over lawns. These materials kill fleas by drying them out instead of poisoning them, but are dangerous to humans, especially young children, if inhaled or absorbed through a cut in the skin. Wear rubber gloves and breathing protection when applying these yourself or have them applied by professionals. Avoid these methods if you have young children.

Flies

Actual size:
1/8" – 1/4"

There are many different types of flies, but only four kinds are found indoors and are considered house pests. The common house fly is gray and about 1/4" long. It breeds in garbage cans, dumpsters, compost piles or other sources of food waste. It can pose a health hazard because it carries disease organisms. The drain fly is somewhat smaller and breeds in sewage and kitchen drains. The tiny yellow-brown fruit fly hovers over fruits and vegetables in the kitchen. The fourth type, the cluster fly, is not associated with garbage or manure. It is larger and darker than the housefly, is a sluggish flier and is often found in clusters on windowsills in winter.

Prevention

The key is to prevent odors. Properly store and dispose of all kitchen wastes. Keep the kitchen clean and free of food scraps and overripe fruit. Wash dishes immediately after eating and keep drains fresh with baking soda and vinegar, followed with hot water. Rinse recyclable cans and bottles before storing. Bury or dispose of pet feces. Install properly fitting screens on windows and doors and keep them in good repair.

Physical control

The best way to dispense with a fly is the old-fashioned way, with a fly swatter. You can also try rolls of sticky flypaper, particularly in garages, near garbage cans and other areas where appearance is not important. These methods should control cluster flies, but will be inadequate for controlling the other types of flies unless proper sanitation practices are followed. Try a saucer of red wine to attract and drown fruit flies.

Ultraviolet light and electrocution traps are not recommended for outside use because they kill as many beneficial insects as they do flies. Chemical insecticides, including impregnated hanging strips, are not recommended as they pose risks to human health and should not be needed if the source of the problem is addressed.

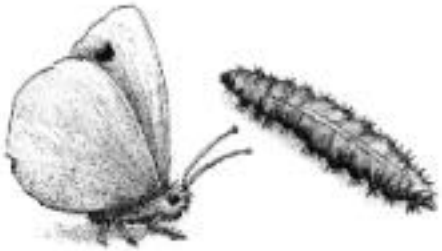
Honeybee swarm

Actual size:
3/8" – 5/8"

The best way to remove a swarm of bees is to call a reputable bee keeper who can, in 20 to 30 minutes, capture the queen bee. The rest of the swarm will follow. Bees in a swarm are engorged with honey and pose very little stinging threat. WSU Master Gardeners keep a list of beekeepers willing to come get the swarm.

Imported cabbageworm

Actual Size:
Butterfly 1" – 2"
Larva 1 1/4"



Adult imported cabbageworms are the white butterflies (with black tips and 2-3 spots on each wing) that flit about in the garden for almost the entire growing season. The larvae, which are medium green, eat large, ragged holes in leaves of cabbage-family plants and cabbage heads and soil the leaves with dark green excrement.

Prevention

Cover plants with a floating row cover all season or until fully mature.

Physical control

Hand-picking imported cabbageworm larvae in light infestations can be very effective. Eggs are conical and light in color and are laid on the undersides of leaves of cabbage family plants such as broccoli and cauliflower. They can be scraped away easily with your fingernail. Use yellow sticky traps to catch female butterflies.

Biological control

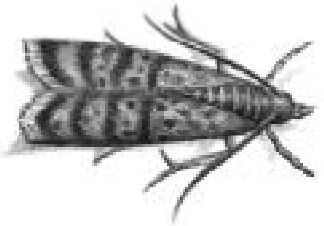
The relatively docile paper wasps, which pose no threat to humans, are known to eat imported cabbageworm larvae (caterpillars) and other soft-bodied insects such as aphids.

Least-toxic chemical control

Larvae may be controlled with Bt (Bacillus thuringiensis).

Indian meal moths

Actual size:
Wingspan 5/8"



Indian meal moth larvae are generally brought home in purchased food such as cereal, flour, oatmeal, trail mix, etc. The larvae may stay in the food, feeding on it all year. When it emerges, it seeks out the warmest place, which, in your house, is the ceiling. If you miss seeing them in their pupae stage, you probably won't miss the adult moth fluttering around in your house.

Prevention

Never leave opened packages of food in your pantry. Always store food in sealed containers. If you have a problem with a particular dry good, store it in the freezer. This also kills the eggs in food that is already infested. Freezing newly purchased packages for 24-48 hours will usually destroy all eggs.

Physical control

The best solution is to check your dry goods and find the container where the moth has laid her eggs and larvae have hatched. As the larvae feed, they make webs that look like spider web strands tangled up in the infested food. Put the infested food in a sealed paper bag and dispose of it. Pheromone traps for catching Indian meal moth adults are available commercially.

Leaf miners

Actual size:
Adult 1/10"
Larva 1/4"

Leaf miner damage

Leaf miners are insects that tunnel between the upper and lower surfaces of leaves. Hatching larvae tunnel through the mid-leaf tissue, feeding as they go, and leave characteristic wavy lines that are visible on the top of the leaf. When ready to pupate, the larvae leave the leaf and drop to the soil, emerging in 10 to 15 days as adult flies. A certain amount of tunneling can usually be tolerated, but the damage is especially troublesome on spinach, chard and sometimes beets since these plants are grown in order to harvest the leaves.

Prevention

Covering the vegetable crop with a floating row cover for the entire life of the plants can be extremely effective. Fall-sown crops are less susceptible. Move plantings at least several feet away from where you planted last year.

Physical control

For small infestations, pick off and destroy the affected leaves. Scratch the small white egg clusters from the backs of the leaves with your fingernail. In enclosed areas such as greenhouses, use yellow sticky traps to catch adults. Plastic mulches prevent leaf miner larvae from reaching the soil to pupate.

Biological control

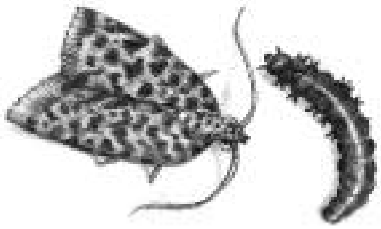
Encourage beneficial predators such as lacewings and spiders for egg and adult control. Other natural enemies include ants, true bugs, flies and birds. Parasitic wasps are able to attack the larvae through the leaf.

Least-toxic chemical control

Neem oil operates as a repellent to adult leaf miners and as a systemic insect growth regulator on larvae. Recent studies also indicate that horticultural oils (not dormant oils) may work against leaf miner eggs, but timing the spray is crucial.

Leaf rollers

Actual size:
Moth 3/4"
Larva up to 1"



There are many types of leaf rollers that infest many different plants, including apple, willow and plum trees, blueberries, photinia and laurel. The larval stage is a caterpillar that folds the leaf and webs it, then feeds inside it.

Physical control

Remove them or the leaves they are in from the plant. Do not put them in your compost bin unless you bury the leaves in the deepest, hottest part. It is better to put them in a sealed paper bag and place it in the garbage.

Biological control

Encourage native parasitic wasps such as Trichogramma. Bt (Bacillus thuringiensis), the bacterium that paralyzes the digestive system of the pest, may be used according to label directions. However it is difficult to deliver to the areas where the larvae are feeding. The rolled leaves provide good protection.

Least-toxic chemical control

Dust or spray with pyrethrum or rotenone for severe infestations only. Apply in two applications, 30 minutes apart. The first drives the caterpillars from hiding, the second kills them.

Moles

Actual size: 7”

Some moles are beneficial – they eat pest insects and improve the soil through aeration. Some, such as the Townsend’s mole, which is found here in the Northwest, eat more vegetation than do other species. All moles eat earthworms, and all species, regardless of their feeding habits, can disfigure lawns, heave up seedlings and sever tender roots as a result of tunneling. Sometimes, though, moles get blamed for damage done by field mice or gophers.

Prevention

Moles cannot dig through soil that is severely compacted, stony or heavy in clay. To discourage mole invasion, build borders of stone-filled, clay and / or compacted soil around the areas you want to protect. These barriers must extend at least 2’ into the ground and be 6” to 12” wide. Or try burying small-mesh fencing 18” to 24” deep so that it stands 2” or 3 ” above the soil surface. Moles also don’t readily invade very wet or very dry soils.

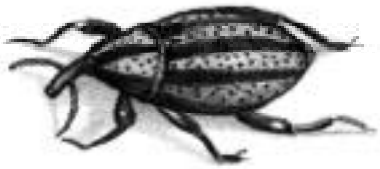
Physical control

Catch live moles in pit traps and release them away from your garden area. Or try flushing moles out of their tunnels with water from a garden hose. This may have the greatest impact in the spring when the young are still in the nest. However, lethal trapping is the most effective and reliable method for getting rid of moles. Success depends on your

perseverance. Scissors-type traps seem to be the most effective. Set the trap in a main run – usually a foot or more under the surface – and not in a shallow, surface-feeding run.

Root weevils

Actual size:
Adults 1/4”



Root weevils commonly infest the root systems of ornamental shrubs such as azalea, primrose, rhododendron and small fruits such as blueberry and strawberry.

Larvae live in the ground around the base of a plant and chew on the bark and the surrounding surface roots primarily during the fall and winter months. Adult root weevils are nocturnal feeders, notching the edges of the leaves, and are most active from late spring through summer.

Physical control

Prune any branches that are touching the ground to prevent adults from crawling up them to feed. Rake any mulch away from the stem to reduce their hiding places. You can apply a collar with a band of a sticky substance such as Tanglefoot around the base of the trunk to trap them and prevent them from reaching their food source. Handpicking the adults at night is an effective control method.

Biological control

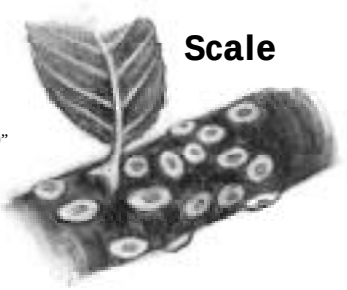
Use beneficial nematodes available at a nursery or garden center. When the nematodes are rehydrated, they attack and kill the root weevil larvae. This treatment is effective in early fall. Follow label instructions.

Least-toxic chemical control

Use Neem to control adults in early summer. Applying diatomaceous earth around plants may help in dry weather. Wear nose and mouth protection when applying, and keep pets away from the area.

Scale

Actual size:
Adult female 1/100" – 1/10"



There are many varieties of scale, which suck plant sap, weakening plants and causing leaves to yellow and drop. Some excrete large quantities of honeydew. There are two to four larval stages. The first looks like a mite, and subsequent stages look like smaller versions of the adult females. Adult females look like hard or soft bumps on stems, leaves and fruit. Males, minute flying insects with yellow wings, do not feed.

Physical control

For small infestations, hand picking or dabbing scale with rubbing alcohol is effective. Prune and dispose of infested branches and twigs.

Biological control

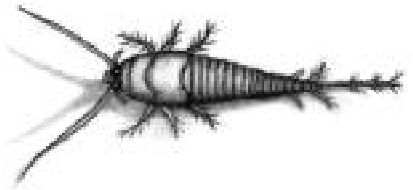
Encourage predators such as aphid lions (green lacewing larvae), syrphid fly larvae, ladybugs (adults and larvae) and parasitic wasps.

Least-toxic chemical control

Use insecticidal soap or horticultural oil spray in early summer on the crawler stage. Do not use oil sprays when the plant is flowering. Apply dormant oil spray only in the winter, or it may defoliate your plant.

Silverfish

Actual size:
3/8" – 1/2"



Silverfish are attracted to carbohydrate substances such as the glue on the back of wallpaper or in the spine of books. They can be a problem in boxes where books are stored. They are attracted to dark, damp areas.

Least-toxic chemical control

Boric acid can be applied on inside carpets and applied in hard-to-reach cracks using spray or powder in a duster bottle with a needle-nose applicator. Never use in areas where crawling children or pets may have contact.

Slugs

Actual size:
1/8" – 5"

Slugs feed at night and prefer moist plant material. They eat many types of vegetables, fruits and flowers. Some of their favorites are strawberries, lettuce, spinach, carrot tops, dahlias and marigolds.

Prevention

Remove garden debris, boards, bricks and tall grass where slugs may hide during the day.

Physical control

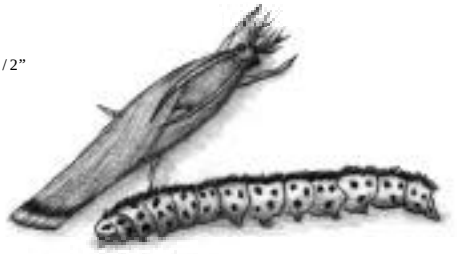
Do a "search and destroy" mission at night by patrolling your yard with a flashlight and killing the slugs you find. You can cut them in two with scissors, spray them with a mixture of one part ammonia in three parts water, or drop them into a bucket of soapy water.

Recent research suggests that sheet copper buried in the soil to create a fence several inches high is very effective barrier. Other barriers, applied as a ring around the base of plants or around the entire garden, include diatomaceous earth, wood ashes, sharp sand and crumbled egg or oyster shells. These may be effective only under dry conditions.

A container of beer, buried part way so that the rim is slightly above ground level, attracts and drowns slugs. There are also several slug traps available at garden centers that attract slugs into them and then prevent them from getting out. You can also make one by simply turning over a wet clay pot in a shady area of the garden. Create a gap for them to crawl through by resting the edge of the pot on a twig or on some irregularity in the ground. The slugs will collect under the pot during the warmest part of the day. Check for slugs and destroy them.

Sod webworms

Actual size:
Moth wingspan 1/2 " – 1 1/2"
Larva 1/2"



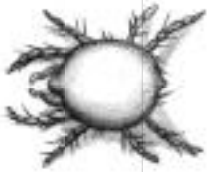
The larvae of this lawn moth feeds on the shoot and crown of the grass, but not the roots. Irregular brown patches appear on the turf and the grass dies back, leaving irregularly sized dead areas. The 1/2" larvae are slender and gray with brown heads. They can be seen when the brown or dead sod is lifted.

Biological control

Beneficial nematodes are effective when applied according to package directions.

Spider mites

Actual size:
1/64"



Spider mites are found on a wide variety of plants. If the leaves start to look pale or mottled, it may be from mites sucking the juices. They are almost too small to see, but can be identified by tapping a suspect leaf over a sheet of white paper. If the little spots move, it's likely they are mites. You may also be able to see webbing on the back of the leaf or between leaves. Spider mites especially like dry conditions. If spider mites have been a problem on your house plants, try raising the humidity around the plants by misting them regularly or setting bowls of water among them.

Physical control

Wash spider mites off with a strong stream of water. You will need to repeat this every several days. Be sure to spray all sides of the leaves thoroughly.

Biological control

Predatory mites, available from nurseries, prey on all types of harmful mites but are most effective in greenhouses. Ladybugs, praying mantis and lacewing larvae also eat mites.

Least-toxic chemical control

Try an insecticidal soap, which is effective when sprayed directly on the mite. Repeated applications may be necessary. Pyrethrum, sabadilla or horticultural oil are also effective. Use dormant oils only in winter. Don't use summer oils when the plant is flowering.

Spiders

Actual size:
1/16 " – 3/4"

Spiders are beneficial predators that consume many destructive insects. There are many types, but only black widow spiders and hobo spiders pose any threat to humans in our area. Hobo spiders build funnel-shaped webs in crawl spaces, wood piles, or around the perimeters of homes. They rarely climb vertical surfaces and are uncommon above basements or ground level. They wait inside the tube and dash out to bite any prey that becomes entangled in the web. They can grow to 3/4" long and may bite intruders with little provocation. Bites are touch sensitive and cause a severe headache in the first several hours following the bite. Bites can be serious and should be treated.

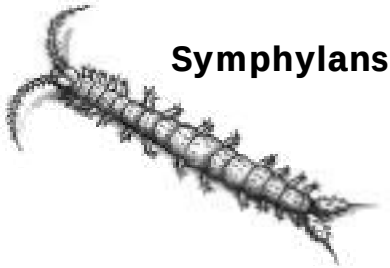
Prevention

Keep tall weeds and grasses away from the house. Shut basement and first floor windows tight or use screens. Make sure the bottoms of doors have insulation stripping that can keep spiders from entering. Avoid areas where spiders congregate.

Physical control

The best way to get rid of a spider in your home is to place a glass jar over it, slip a card underneath and carry it outside. They are fragile and will usually be killed by sweeping with a broom. Spraying with a pesticide is usually pointless because woodpiles and similar areas are so attractive to spiders that they usually return.

Symphylans



Actual size:
1/20" – 1/4"

Symphylans, sometimes called garden centipedes, are found in rich, moist soils. Symphylans are about 1/4" long at their largest, white, have 12 pairs of legs, and feed on plant roots. Note that true centipedes have 15 pairs of legs and eat other insects, so correct identification is very important.

Symphylans are usually brought into a landscape in manure or compost and thrive in very moist soils high in organic matter. They feed on the roots of many different plants and, in high numbers, can kill young starts. Older plants often can outgrow the damage as long as the have adequate water. Susceptible plants include tomatoes, lettuce, sugar beets, chrysanthemum, asparagus, beans, brassicas, celery, cucumber, parsley, peas, peppers, potatoes and strawberries.

Symphylans are especially difficult to get rid of once they have become established in a garden. None of the following suggestions are foolproof, but, when used together, can probably reduce their numbers.

Prevention

The best bet for symphylan control is to not get them in the first place. If you are bringing in manure to add to the garden, look it over with a magnifying glass for symphylans before applying it. If your soil tends to be wet, be careful not to over apply organic matter, don't use organic matter as your only source of fertilizer or consider moving the garden to a drier location. If they inhabit your compost pile, eliminate that pile and resume composting on a plastic sheet or concrete slab. Symphylans tend to occur in spots in the garden, so crop rotation into non-susceptible plants may help.

Biological control

Beneficial nematodes may help to control symphylans. Be sure to follow label directions.

Physical control

If the site is level and on the wet side, you can try flooding the area for several days in winter to drown symphylans. Or, cover the site with plastic on a sunny, warm day to heat the site and kill the pests. Symphylans are fairly delicate creatures, and cultivation will also help reduce their numbers. Rototill in the spring and fall and hand cultivate around plants during the season to stir up the soil and destroy symphylans.

Tent caterpillars

Actual size:
Up to 3”

These caterpillars spin the silky white tents that cover the tips of branches. They damage plants by eating foliage as it emerges. They eat leaves off many deciduous trees and shrubs, especially walnut, alder, willow, fruit trees and roses. If a tent has been on a branch for awhile, chances are some caterpillars are fully grown (up to 3”) and have left the tent to select a site to spin cocoons. After about two weeks, adult moths emerge, mate, lay eggs and die. The eggs are laid in a foam-like band around small twigs or branches of the host tree where they hibernate over the winter. When new leaves begin to appear in the spring, the eggs hatch.

Physical control

Consider tolerating a few tents. These caterpillars are native insects and are controlled in the long term by natural factors. Prune out branches containing tents in particularly valued trees or those with heavy infestations. Prune early in the morning or in the evening when caterpillars are in their tents. Put tents in a sealed paper bag in the garbage. During the winter, examine branches and rub off egg masses that appear as hardened gray or brown frothy material, somewhat similar to Styrofoam. Egg masses

are usually 1/2" long bands surrounding twigs. Deposit in a bag, seal it and place it in the trash.

Biological control

Tachinid flies deposit white eggs, natural parasites, in visible rows on the caterpillars' backs. If you look closely at the caterpillars and see these eggs, natural controls are working. You can introduce the bacterium Bt (Bacillus thuringiensis), but to be effective, it must be sprayed to thoroughly coat the leaves since Bt is a stomach poison effective only when ingested. Bt will kill all caterpillars, including those that mature into desirable butterflies. If you use Bt, use it only on the affected plant and follow label directions.

Termites (damp wood)

Actual size:
3/4" – 1"

These termites land on your house, shed their wings and try to find a home. They will die if they cannot find damp wood.

Prevention

Do not leave soil piled up next to your house or in contact with any wood structures. Also, repair any leaky pipes that keep surrounding wood moist. Firewood should be stored in a dry place; wet wood attracts termites.

Thrips

Actual size:
Up to 1/5"

Thrips are tiny, elongated, fast-moving insects 1/5" long or less. Adults and nymphs suck sap from plant tissue, leaving silvery spots or streaks on leaves. In the Pacific Northwest, thrips are a particular problem

on gladioluses. Thrips can apparently produce young without mating. The process, which is also common in aphids, permits a very rapid population buildup.

Physical control

In greenhouses, hanging blue sticky traps helps catch adults before they move into the plant.

Biological control

Encourage native predators such as lacewings and lady beetles. Because most thrips pupate in the soil, they are potentially susceptible to insect-eating nematodes. Two predatory mites also appear to have substantial potential for thrips control.

Least-toxic chemical control

Insecticidal soap or horticultural oils can be used to provide temporary relief from thrips while you are waiting for predators to arrive. As a last resort, spray with alcohol, neem, pyrethrin or sabadilla, or apply diatomaceous earth, just on the undersides of leaves and on soil around affected plants.

Wasps and yellow jackets

Actual size:
1/2" – 3/4"

Wasps and yellow jackets are beneficial. They eat other insects. If they become a nuisance, use traps specifically designed to capture the type of pest you have. Consult a knowledgeable nurseryperson for advice on which one to use. Place traps away from high-use areas. Traps only work early in the season (before August).

Prevention

Cover garbage cans and outdoor foods, especially fruit and other sweets.